

Since last decade, the continuous emergence of more and more powerful supercomputers, generally massively parallel, have obliged code developers to adapt the scientific and engineering simulation codes. Along with this indispensable adaptation, scientific and engineers have been proposing new challenges, now within computational reach, like for example complex multiphysics problems.

These two facts have pushed forward the developments of new algorithms and even new paradigms to efficiently exploit the growing computational resources. This minisymposium proposes to expose new scientific and computational techniques to face these challenges. These techniques do not exclusively cover the computational mechanics simulation code itself but all the necessary tools involved in the design of a simulation code as well as in the simulation process. Therefore, the topics intended to be covered are: Meshing, Software Libraries and application to multiscale-multiphysics problems, high performance computing towards exascale computing, including programming models for multicore, accelerators, supporting tools in performance evaluation, visualization, verification and validation, scientific workflows, theoretical frameworks, methodology and algorithms for Uncertainty Quantification.